

Second Response - Remarks

Drawing Objections

Please substitute the enclosed two new sheets of drawing containing figure 3 and figures 4, 5 and 6, respectively for the corresponding sheets of drawings presently in the case. In figure 3, the section line near the upper right hand corner has been changed to 5-5. In figure 4, the lead line for "48" has been corrected and lead lines for "18" have been added.

These drawing changes overcome the Examiner's objection to the drawings.

Disclosure Objection

The Examiner has objected to the disclosure because "contrary to various statements in the specification (and claims) the arcuate shaped elastomeric pad will not provide a uniform contact pressure. The center of the pad (as viewed in Fig. 4) will provide a greater pressure contact pressure because of the greater amount of resilient material that is compressed between the rigid materials"

Regarding the objection to the disclosure, the Examiner has not specified where the specification states that the elastomeric pad provides a uniform contact pressure. The specification in fact does not state that the elastomeric pad provides a uniform contact pressure. Paragraph 0026 of the specification states "The adjustment is preferably such that the elastomeric pad is resiliently deformed by the clamp housing 30 to provide a *substantially* uniform contact pressure to the elongate array of electrical contacts 28 of the lower contact portion 26 that engages the matching array of electrical contact pads 18 carried by the lower printed circuit board 16." Claims 5, 8 and the Abstract of the Disclosure also refer to "a substantially uniform contact pressure".

The statement of Raymond Jose Norland is enclosed. This statement removes any possible objection to the disclosure and claims.

Claim Objections

Regarding the objection to claims 1-3, claim 1 has been amended to correct a typographical error. Specifically "ad" in line 18 of claim 1 has been changed to "pad". This removes the objection to claims 1-3.

Regarding the objection to claims 5 and 8-11, the statement of Raymond Jose Norland is enclosed. This statement removes the objection to claims 5 and 8-11.

Claim Rejections

The rejection of claim 1-11 under 35 USC § 103(b) as unpatentable over the applicant's prior art shown in figures 1 and 2 of the patent application in view of U.S. Patent 4,798,541 to Porter is respectfully traversed.

Applicant's prior art shown in figures 1 and 2 of the patent application discloses a known 175 way "high density" electrical connector 1 employing a flexible printed circuit 2 that has 175 closely spaced contacts arranged rank and file with 7 rows of contacts each containing 25 contacts. In this high density electrical connector, an elongated elastomeric contact pressure pad 3 engages the flexible printed circuit to press the contacts 4 of the flexible printed circuit against the mating set of contact pads 5 carried by a rigid printed circuit board 6. The elastomeric pad 3 has twenty-five spaced ribs 7 that extend laterally across the elastomeric pad. Each rib 7 is aligned with a short transverse row of contacts and engages the back side of the flexible printed circuit pushing the contacts 4 against the contact pads 5 when the flexible printed circuit 2 and the elastomeric pad 3 are clamped between a clamp housing 8 and the printed circuit board 6. Clamp housing 8 is adjusted by machine screws 9 that screw into attachment portions of the clamp housing 8. Screws 9 pass through aligned locator holes in a stiffener bar 9a, printed circuit board 6 and flexible printed circuit 2 to align contacts 4 with contact pads 5 and the ribs 7 with the short rows of contacts 4.

The elastomeric pad 3 of the prior art discussed in connection with figures 1 and 2 of the patent application drawing, creates heavy forces on the top and bottom ends of the perimeter causing uneven forces aimed towards the center portion.

On the other hand, the flexible printed circuit engaging surface of elastomeric pad 44 or 46 of the invention has an arcuate shape to allow localized force to be distributed down the center portion, at the same time allowing even distribution of

forces to be maintained towards the long outer edges of the elastomeric pad, creating an excellent overall electrical connection of the elongated array of contacts to the elongated array of electrical contact pads. The arcuate shape of the elastomeric flexible printed circuit engaging surface allows uniform pressure distribution along the overall region of the perimeter, which allows the flexible printed circuit to maintain an electrical connection.

U.S. Patent 4,798,541 to Porter, hereafter the Porter '541 patent, discloses a right angle electrical connector 10 for connecting a mother board 14 to a daughter board 12 comprising a housing 15 having a slot 16. An elastomeric member 28 which is disposed in the housing has an upper slot 29 aligned with the housing slot 16 and a rounded lower portion 30 that protrudes from the housing 15. A flex circuit is folded around the elastomeric member 28 with its free ends disposed in the upper slot 29 as shown in figure 3 of the Porter '541 patent. The free ends make electrical contact with the edge connector pads 52 on the daughter board 12 when the daughter board 12 is inserted into the slots 16 and 29 as shown in figures 4 and 7 of the Porter '541 patent. The middle portion makes electrical contact with the connector pads 53 and 55 on the mother board 14 when the housing 15 is fastened to the mother board 14 compressing the elastomeric member 28 as shown in figures 5 and 7 of the Porter '541 patent.

The right angle electrical connector 10 of the Porter '541 patent connects relatively wide, elongate edge connector pads 52 of daughter board 12 with relatively wide, elongate connector pads 53, 55 of mother board 14 with at least two of the conductors 45 of the flexible printed circuit 28 that lead from each of the edge connector pads 52 to each of the connector pads 53 or 55. See column 4, lines 41-45 of the Porter '541 patent.

The right angle electrical connector 10 of the Porter '541 patent has only two rows of edge connector pads. Thus the Porter '541 patent does not have anything to do with providing uniform contact pressure between an array of electrical contact pads arranged in at least three rows with several electrical contact pads in each row and a matching array of electrical contacts. Consequently, the Porter '541 patent does not teach or suggest any solution to the problem of providing uniform pressure in the prior art arrangement shown in figures 1 and 2 of the patent application. Therefore, it is not obvious to use the elastomeric member 28 of the right angled connector 10 of the Porter '541 patent in the prior art high density connector shown in figures 1 and 2

of the patent application to solve a problem that does not exist in the right angle electrical connector 10 of the Porter '541 patent.

Base claims 1, 4 and 7 have been amended to specify the high density electrical connector of the invention has an array of electrical contact pads arranged in at least three rows with several contact pads in each row, thereby distinguishing the claims from the non-analogous type of electrical connector shown in the Porter '541 patent.

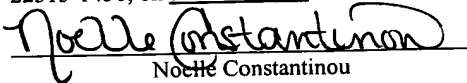
The further limitations of dependent claims 2, 3, 6, 9, 10 and 11 further distinguish the claimed invention over the prior art and these further limitations have not been taken into account. For instance, dependent claim 9 states that the longitudinal ribs are flattened whereas the ribs of elastomeric member 28 of the Porter '541 patent are not and cannot be flattened due to the required open slot 29. As another example, dependent claim 11 states that the elastomeric pad has a lesser number of longitudinal ribs than the flexible printed circuit has longitudinal rows of contacts. The Porter '541 patent does not disclose or suggest such a relationship.

Please reexamine claims 1-11 in view of the foregoing amendments and foregoing remarks.

The Commissioner is hereby authorized and respectfully requested to charge any deficiencies or credit any overpayments to our Deposit Account No. 50-0831. A duplicate copy of this sheet is enclosed.

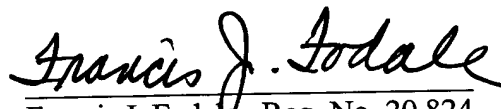
CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on June 23, 2004.


Noelle Constantinou

Respectfully submitted,

REISING, ETHINGTON,
BARNES, KISSELLE, P.C.


Francis J. Fodale Reg. No. 20,824
P.O. Box 4390
Troy, Michigan 48099-4390
(248) 689-3500

of the patent application to solve a problem that does not exist in the right angle electrical connector 10 of the Porter '541 patent.

Base claims 1, 4 and 7 have been amended to specify the high density electrical connector of the invention has an array of electrical contact pads arranged in at least three rows with several contact pads in each row, thereby distinguishing the claims from the non-analogous type of electrical connector shown in the Porter '541 patent.

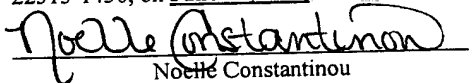
The further limitations of dependent claims 2, 3, 6, 9, 10 and 11 further distinguish the claimed invention over the prior art and these further limitations have not been taken into account. For instance, dependent claim 9 states that the longitudinal ribs are flattened whereas the ribs of elastomeric member 28 of the Porter '541 patent are not and cannot be flattened due to the required open slot 29. As another example, dependent claim 11 states that the elastomeric pad has a lesser number of longitudinal ribs than the flexible printed circuit has longitudinal rows of contacts. The Porter '541 patent does not disclose or suggest such a relationship.

Please reexamine claims 1-11 in view of the foregoing amendments and foregoing remarks.

The Commissioner is hereby authorized and respectfully requested to charge any deficiencies or credit any overpayments to our Deposit Account No. 50-0831. A duplicate copy of this sheet is enclosed.

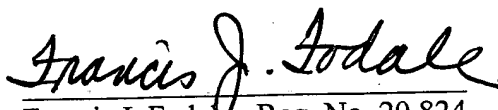
CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on June 23, 2004.


Noelle Constantinou

Respectfully submitted,

REISING, ETHINGTON,
BARNES, KISSELLE, P.C.


Francis J. Fodale Reg. No. 20,824
P.O. Box 4390
Troy, Michigan 48099-4390
(248) 689-3500

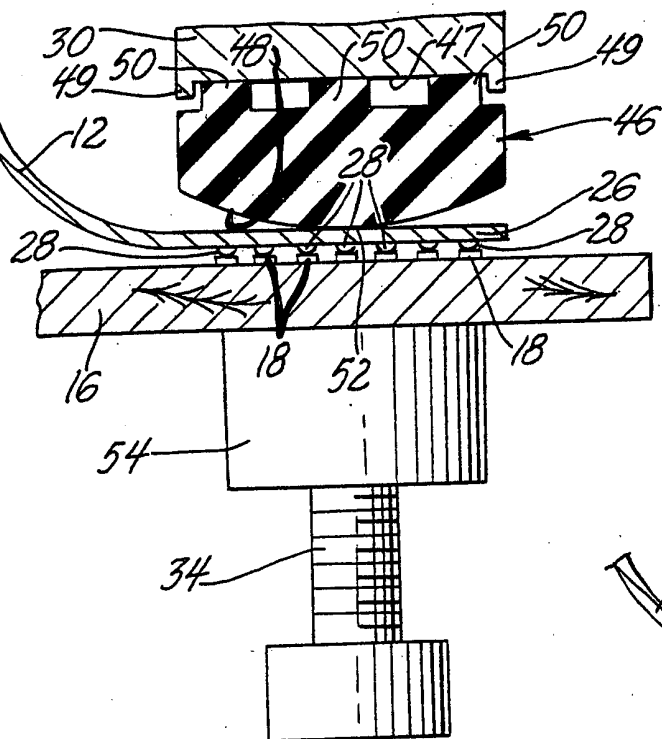


Fig. 4

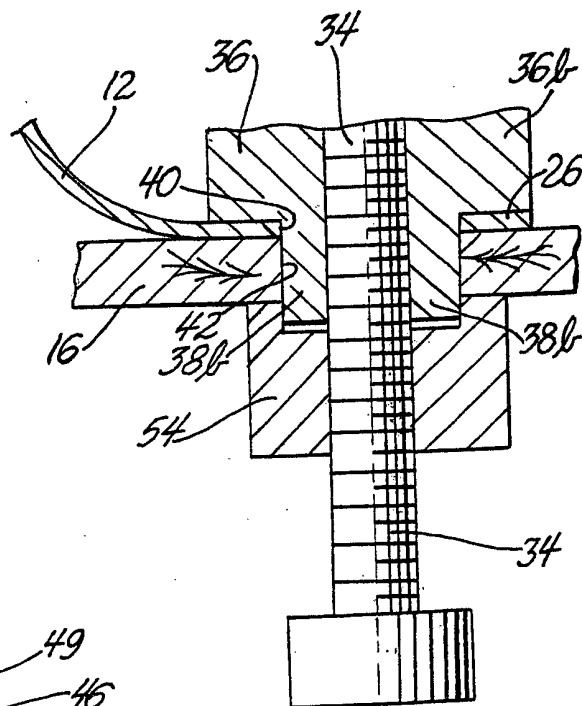


Fig. 5

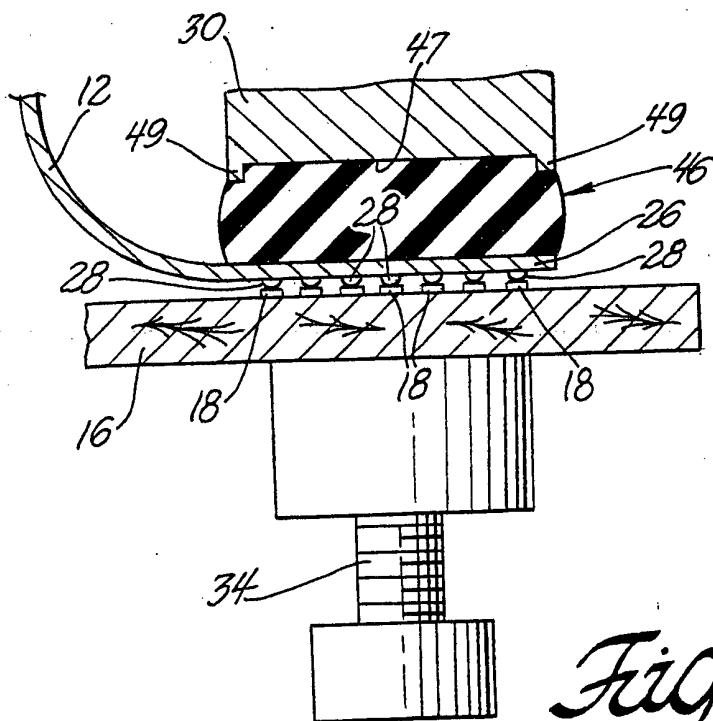


Fig. 6